

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380
	)	

To: The Commission

**JOINT REPLY COMMENTS OF  
THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC.  
AND THE NATIONAL ASSOCIATION OF BROADCASTERS**

January 31, 2005

## **SUMMARY**

The record compiled in this proceeding does not support authorization of unlicensed devices in the television broadcast spectrum. Broadcasters, engineers, cable providers, wireless microphone manufacturers, public safety advocates, consumer electronics manufacturers, and others have documented the need for caution and real-world analysis of the unlicensed devices proposal. To proceed without the benefit of such analyses would endanger the public's television service at a pivotal moment in the digital transition.

Next month, stations with an in-core allotment will tentatively elect their channels for post-transition operation. Technical analyses of the Association for Maximum Service Television, Inc. (MSTV), the Society of Broadcast Engineers, and Qualcomm (to name a few) show how unlicensed devices would disrupt that intricate process and disrupt the digital transition. As recently as December 2004, however, Congress has expressed its desire to see the digital transition brought to a successful conclusion. The Commission has also made plans for the digital conversion of low power television services, which will be of particular importance to rural communities. Pushing forward with the unproven and untested unlicensed devices proposal would undermine both of these public interest goals.

The "spectrum sensing" and other interference-mitigation techniques touted by supporters of the unlicensed devices proposal do not offer realistic solutions – they would leave the public unprotected from harmful interference. In the few areas that primitive "spectrum sensing" prototypes have been tested – such as the 5 GHz U-NII band – they have fallen short. Nor could an unlicensed device reliably determine whether a given channel is "vacant" by comparing its GPS-determined location to a static database of broadcast services. Many unlicensed devices would lack a line-of-sight to a GPS signal; even if they could access that signal, the static database would lack real-time information on the broadcast services in that

device's area. The Commission should not base real-world policy decisions on unproven promises of technology to come.

Another acute flaw in the unlicensed devices proposal is the lack of an interference *enforcement* mechanism. As Qualcomm explains, it could be “impossible” to “pinpoint and cure harmful interference” from unlicensed devices. Thus, there is very real potential for an enforcement nightmare in which broadcast television viewers will suffer interference that cannot be accurately detected or cured. Once an unlicensed device is in the field, the device and its resulting interference are there to stay. The Commission cannot responsibly move forward without addressing this problem.

Fundamentally, the unlicensed devices proposal threatens the Commission's sensible and legally-mandated provision of *ex ante* interference protection to FCC-licensed services. Since the 1930s, unlicensed devices ranging from simple remote controls to state-of-the-art Wi-Fi chips have operated under a strict “do no harm” principle. If an unlicensed device interferes with a lawfully-operating licensed service, it must cease operation; likewise, the unlicensed device may not demand interference protection from licensed (or even other unlicensed) services. Under this principle, the public has enjoyed robust and reliable radiocommunications for over seventy years. But as analyses submitted by Motorola, MSTV, Consumer Electronics Association, Shure and others document, unlicensed devices in the television broadcast bands *will cause* harmful interference to licensed services. Adoption of the unlicensed devices proposal currently before the Commission would thus be ill-advised and illegal.

MSTV and the National Association of Broadcasters (NAB) accordingly urge the Commission to conduct real-world analyses of *whether* and *how* unlicensed devices could be

introduced into the television broadcast spectrum. At a minimum, the Commission should not authorize any new use of the broadcast spectrum until the public's transition to digital television is complete. It should then conduct field studies to determine the appropriate power levels, interference-mitigation and enforcement mechanisms that could reliably prevent unlicensed devices from interfering with the public's television service as well as other incumbent uses of the broadcast spectrum.

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To protect the public's television service and its ongoing transition to digital television (DTV), the Commission should not authorize unlicensed device operation in the television broadcast spectrum at this time. The proposal outlined in the Commission's *Notice of Proposed Rulemaking* ("unlicensed devices proposal") is a risky experiment in spectrum sharing that is particularly inappropriate at this phase of the DTV transition. The vast majority of broadcasters, nearly 1,500, are transmitting both an analog and a digital signal. Congress, the Commission, broadcasters, consumer electronics manufacturers, and others are expending billions of dollars to advance consumers' acceptance of DTV technology. Given all this, the Association for Maximum Service Television, Inc. (MSTV) and the National Association of Broadcasters (NAB)<sup>1</sup> respectfully urge the FCC not to risk undermining consumer confidence by exposing the public to new interference from unlicensed devices.

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<sup>1</sup> MSTV is a non-profit trade association of local broadcast television stations committed to achieving and maintaining the highest technical quality for the local broadcast system. NAB is a non-profit, incorporated association of radio and television stations that serves and represents the American broadcast industry.

The fifty-five comments filed in reaction to the Notice reveal an intense debate and conflicting analysis concerning the interference potential of unlicensed devices to the public's free and universal over-the-air television service. Unlike certain parties that warn the Commission against too much "caution" in protecting the public's access to over-the-air television, Qualcomm, Motorola, the Society of Broadcast Engineers, Consumer Electronics Association, Shure Inc., the National Translator Association, Entravision Holdings, MSTV, and others<sup>2</sup> have provided engineering analyses demonstrating the real-world harm that the unlicensed devices proposal would bring about, especially during the digital transition.<sup>3</sup> Most notably, these studies conclude that the Notice's proposal neither protects television reception nor provides effective means of *preventing* or *remedying* harmful interference.<sup>4</sup> The presence of unlicensed devices in the broadcast spectrum would also obstruct the Commission's goals for the digital conversion of low power stations. The record thus provides no basis for authorizing unlicensed devices under the proposal outlined in the Notice.

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<sup>2</sup> Others urging caution and further study include the Association of Public Television Stations; National Cable & Telecommunications Association; Pappas Telecasting Co.; Cox Broadcasting; Association of Public-Safety Communications Officials-International Inc.; Cohen Dippell and Everist, P.C.; Community Broadcasters Association; WDLP Broadcasting Co.; Commercial Broadcasting Corp.; Professional Audio Manufacturers' Alliance; and NAMM, the International Music Products Association; and Red River Broadcasting.

<sup>3</sup> As described below, sharing of the broadcast spectrum with unlicensed devices would also derail the Commission's goals for digital conversion of low power television services.

<sup>4</sup> See especially Joint Comments of MSTV and NAB, ET Docket No. 04-186 (filed Nov. 30, 2004) (MSTV/NAB Comments); Comments of the Consumer Electronics Association, ET Docket No. 04-186 (filed Nov. 30, 2004) (CEA Comments); Comments of Qualcomm, Inc., ET Docket No. 04-186 (filed Nov. 30, 2004) (Qualcomm Comments); Comments of Motorola, Inc., ET Docket No. 04-186 (filed Nov. 30, 2004) (Motorola Comments); Comments of Shure Inc., ET Docket No. 04-186 (filed Nov. 30, 2004) (Shure Comments); Comments of the Society of Broadcast Engineers, ET Docket No. 04-186 (filed Nov. 30, 2004) (SBE Comments); Comments of Cohen, Dippell & Everist, P.C., ET Docket No. 04-186 (filed Nov. 30, 2004) (Cohen, Dippell and Everist Comments); Comments of the National Translator Association, ET Docket No. 04-186 (filed Nov. 30, 2004); and Comments of Shure Inc., ET Docket No. 04-186 (filed Nov. 30, 2004) (Shure Comments).

Accordingly, MSTV and NAB urge the Commission to conduct further studies in accordance with the concerns raised in the record. Such analyses are prerequisite to any new use for the television broadcast spectrum.

**I. COMMENTERS DOCUMENT SERIOUS CONCERNS REGARDING THE INTERFERENCE POTENTIAL OF UNLICENSED DEVICES IN THE TELEVISION BROADCAST SPECTRUM.**

**A. The Notice's Proposed Means For Mitigating Interference From Unlicensed Devices Are Unproven and Inadequate.**

The record in this proceeding demonstrates a fundamental flaw of the proposed rules: Wi-Fi-like unlicensed devices in the television broadcast spectrum cannot be reliably designed to prevent interference to existing services. Until actual methods are proven following demonstrated field testing, the Commission will have no basis for proceeding with the unlicensed devices proposal.<sup>5</sup> The public's free-over-the-air television service merits proven and reliable interference protection from these Wi-Fi unlicensed devices.

A recent example of unlicensed device interference to military radar underscores the dangers posed by unlicensed devices operating in licensed spectrum bands. On Jan. 27, 2005, United States Air Force officials reported that wireless Internet connections in the 5 GHz band are interfering with military radar at the Eglin Air Force Base in Florida.<sup>6</sup> That base is home of the Air Armament Center, which develops and tests "smart bombs" and other high-tech weapons. Radar is considered "a vital tracking tool for those tests."<sup>7</sup> According to Master Sgt. Dawn Hart, "The sources of interference show up as targets on tracking radars because of their

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<sup>5</sup> See, e.g., CEA Comments at 10; Comments of the Association of Public Television Stations, ET Docket No. 04-186 (filed Nov. 30, 2004) (APTS Comments) at 3.

<sup>6</sup> See, e.g., Associated Press, *High Speed Net, Wi-Fi Interfering with Military Radar*, USA Today (Jan. 28, 2005).

<sup>7</sup> *Id.*

strong signals.”<sup>8</sup> Officials from the county which is home to the base mistakenly (but understandably) opined, “There are evidently people who are firing up [wireless Internet] hotspots without [FCC] licensing.”<sup>9</sup> In fact, those Wi-Fi hotspots are in the *unlicensed* U-NII band.<sup>10</sup> It is unclear when, or even if, officials will be able to locate and remedy the unlicensed sources of harmful interference to the radar tests. As the Commission considers authorizing unlicensed devices in the television broadcast spectrum, it should look to the Eglin example as a cautionary tale.

### **1. The Commission Should Not Rely On Undeveloped “Spectrum Sensing” Technologies.**

“Spectrum sensing” technologies – which are proposed by some parties as the only *potentially* reliable method for protecting the public’s television service from unlicensed device interference – cannot provide a basis for moving forward with the unlicensed devices proposal because they are unproven, untested, and virtually nonexistent. As Motorola explains, “[i]t would be premature to rely on spectrum sensing until these mechanisms are shown to be reliable via comprehensive study and real-world testing.”<sup>11</sup> Shure, Inc. points out that “no

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<sup>8</sup> Associated Press, *High Speed, Wi-Fi Internet Messing with Eglin AFB Radar*, South Florida Sun-Sentinel (Jan. 28, 2005).

<sup>9</sup> *Id.*

<sup>10</sup> See also Glenn Fleishman, *Radar Violators in Florida*, Wi-Fi Networking News (Jan. 28, 2005), available at <http://wifinetnews.com/archives/004757.html> (last visited Jan. 31, 2005) (“Any device using the 5.250-5.350 GHz band (available for a while) or the 5.470-5.725 GHz band (new as of Nov. 2003) must avoid stepping on existing signals and back down power to only use as strong a signal as is needed at any given time. It’s possible that someone is using a 5 GHz channel that was previously assigned in the 5.725-5.825 GHz band. Since those were intended for outdoor point-to-point use and don’t require the limits that are defined for two of the three lower bands, it might be legal and unintentional. Or they’re using equipment not approved for use in the US or have modified US-licensed equipment. Or, even, it’s very sloppy out-of-band spillover.”).

<sup>11</sup> Motorola Comments at 8. Motorola adds, “it is unclear how a spectrum sensing device could determine the impact of its emissions without knowledge of its proximity to the contour . . . Although the technology appears (continued...) ”

prototypes of unlicensed devices that incorporate spectrum sensing ... have been built.”<sup>12</sup>

Similarly, IEEE states that cognitive radio and similar technology will only enable use of white space after “appropriate technologies ... are developed and proven.”<sup>13</sup> There currently exists no sensing method by which a device would know the interference it will cause to a particular victim transmitter.<sup>14</sup> As Pappas Telecasting Companies (Pappas) explains, the sensing circuitry in an unlicensed device is “certain” to miss weak TV signals that are “easily available to an outdoor directional antenna” and thus relied upon by viewers.<sup>15</sup> The Commission should not base real-world policy decisions on unproven promises of technology to come.

Those commenters seeking immediate introduction of unlicensed devices make hollow claims regarding the near-term availability of spectrum sensing technology. For example, both Intel and Microsoft cite the “precedent” of dynamic frequency selection (DFS) and transmit power control (TPC) technology in the newly-expanded unlicensed 5 GHz U-NII band, which (as noted above) share spectrum with licensed military radar.<sup>16</sup> In fact, the putative unlicensed users of that spectrum have yet to develop a functioning means to permit coexistence

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promising, Motorola recommends that the Commission support further experimentation with the technology, but not permit spectrum sensing until reliability is proven.” *Id.* at 16.

<sup>12</sup> Shure Comments at 18.

<sup>13</sup> Comments of IEEE 802.18 RR-TAG, ET Docket No. 04-186 (filed Nov. 30, 2004) (IEEE Comments) at 16. Indeed, IEEE notes that a DTV signal is “the worst case TV signal to sense due to the digital nature of the 8-VSB modulation and the relatively flat spectrum shape which spreads the signal power over most of the 6 MHz channel.” *Id.* at 12.

<sup>14</sup> Comments of Qualcomm, Inc., ET Docket 03-237 (filed April 5, 2004) at iv (“an unlicensed transmitter cannot possibly know the interference it will cause at all licensed receivers before it transmits since it would have to know both the noise temperature of the licensed receiver and the gain that each licensed receiver has in the direction of the unlicensed transmitter.”).

<sup>15</sup> Comments of Pappas Telecasting Co., ET Docket No. 04-186 (filed Nov. 30, 2004) (Pappas Comments) at 11.

<sup>16</sup> Comments of Microsoft Corp., ET Docket No. 04-186 (filed Nov. 30, 2004) (Microsoft Comments) at 14 (citing use of DFS in the 5 GHz band and claiming that “spectrum sensing is already a reality.” *See also* Comments of Intel Corp., ET Docket No. 04-186 (filed Nov. 30, 2004) (Intel Comments) at 17-18.

of the unlicensed devices and licensed military radar.<sup>17</sup> Rather than providing a precedent for introducing unlicensed uses into licensed spectrum, the 5 GHz example casts serious doubt as to the maturity of cognitive radio technologies.

Other commenters make inapposite analogies to allegedly “cognitive” or “smart” technology already on the market. For example, New America Foundation (New America) touts the “mature” technology used in 802.11b devices that use “listen before talk” protocols in the 2.4 GHz dedicated unlicensed band, and suggests that the same type of technology could “easily” be applied to the television broadcast spectrum.<sup>18</sup> New America falsely presumes that if the broadcast spectrum were to become an unlicensed commons, the type of technology already in use in 802.11b devices would protect the public’s access to its television service and other incumbent services. In fact, experience in the 2.4 GHz band shows that the problems associated with unlicensed device proliferation will eventually and often quickly catch up to technological innovation. Wi-Fi devices using different standards often interfere with each other, and their “listen before talk” protocols are of little help.<sup>19</sup> The television broadcast spectrum would fare no better under the Notice’s proposal.

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<sup>17</sup> *OET Chief Confident That 5 GHz Sharing Issue Can Be Resolved*, TR Daily, Dec. 9, 2004.

<sup>18</sup> See Comments of the New America Foundation, *et al.*, ET Docket No. 04-186 (filed Nov. 30, 2004) (New America Comments) at 40.

<sup>19</sup> See *e.g.*, Amy Schatz, *U.S. Airports and Airlines Clash Over Radio Waves in Terminals*, The Asian Wall Street Journal, M8 (June 9, 2004) (“[A]s the sources of [Wi-Fi] signals proliferate, they have triggered a turf war putting airports against air carriers.”); Richard Shim, *College Backs Off Wi-Fi Ban*, CENT News.com, Sept. 16, 2004 (reporting that administrators at the University of Texas at Dallas have eased prohibitions on private dormitory “hot spots,” despite significant interference concerns, because “it was not clear that the university had the legal right to enforce the policy.”).

New America claims in one of its policy papers that “[w]hen transmitters and receivers are as smart as humans, the best rules to prevent interference are no rules at all.”<sup>20</sup> Such conjecture is not grounded in the reality of current technology and cannot provide a basis for sound policymaking. Further, it is not enough to speculate that allowing unlicensed devices into the television broadcast spectrum would “spur ... investment in cognitive technologies,” as Intel argues.<sup>21</sup> Parties pushing the Commission to hastily adopt the Notice’s proposal ask the Commission to solely rely on unproven and unspecified cognitive technologies to protect the public’s television service from unlicensed device interference.<sup>22</sup> New America’s counsel, the Media Access Project (MAP), has accused the Commission of a “timid vision” for even proposing specific interference mitigation techniques.<sup>23</sup> MSTV and NAB respectfully disagree. Although looser standards may be appropriate in dedicated unlicensed bands, the public’s free, over-the-air television service merits clear and viable interference protection standards. A technology which has yet to be developed cannot protect the viewing public from harmful interference, nor can it form the basis of expanded authorizations for unlicensed devices.

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<sup>20</sup> Kevin Werbach, *Radio Revolution – The Coming Age of Wireless*, New America Foundation, (2003), available at [http://www.newamerica.net/Download\\_Docs/pdfs/Pub\\_File\\_1427\\_1.pdf](http://www.newamerica.net/Download_Docs/pdfs/Pub_File_1427_1.pdf) (last visited Jan. 25, 2005), at 6 (Werbach/New America White Paper).

<sup>21</sup> Intel Comments at 11. *See also* Comments of the Wi-Fi Alliance, ET Docket No. 04-186 (filed Nov. 30, 2004) at 4 (professing “certain[ty]” that “its membership can ... develop and produce devices that do not exceed interference thresholds and avoid completely co-channel operation.”).

<sup>22</sup> New America Comments at 32 (“[T]he Commission should simply require that all devices have sufficient ‘geographic intelligence’ to determine their location within a radius of 10 meters.”).

<sup>23</sup> *See Media Access Project Action Alert – FCC Proceeding: Unlicensed Underlay in Broadcast Bands Proposal Terribly Flawed – Comments Needed to Support Changes to Proposed Rules*, posted Nov. 11, 2004, available at <http://www.wetmachine.com/index.php/item/159> (last visited Jan. 24, 2005).

**2. The Notice's Other Proposed Interference Prevention Techniques Would Be Ineffective.**

The record provides little support to the Notice's other proposals for protecting the public from harmful interference. For example, many commenters raise concerns with the claim that an unlicensed device could "know" if a channel is vacant by using GPS technology to determine its location and then comparing that location to a database of licensed services' protected contours.<sup>24</sup> IEEE is critical of reliance on GPS receivers, which "may not be able to function adequately in all circumstances, especially in shadowed areas and for indoor terminals."<sup>25</sup> The Society of Broadcast Engineers (SBE) similarly explains how an unlicensed device in a "shielded" area such as a high-rise office building would have "little or no line of sight to GPS satellites."<sup>26</sup> The Commission has no basis to rely on GPS technology as justification for authorizing unlicensed devices in the television broadcast spectrum.

Even if the Commission were to overlook the myriad instances in which an unlicensed device will be unable to determine its location, there would remain the virtually intractable issue of real-time reliance on a static broadcast database. Despite the Commission's impressive efforts in creating a DTV Table of Station Assignment and Service Information, the fact remains that this Table and other broadcast databases are not, as IEEE observes, sufficiently accurate or adaptable to "provide the required degree of protection from harmful interference."<sup>27</sup>

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<sup>24</sup> Other commenters, such as New America, oppose the use of a database on philosophical grounds. New America Comments at 35.

<sup>25</sup> IEEE Comments at 8. Microsoft makes the opposite claim, that somehow *portable* unlicensed devices could rely on GPS to determine if a television channel were "vacant." See Microsoft Comments at 10. Because the portable devices would often be indoors, GPS would provide even less effective for portable devices, because the GPS signals would often fail to reach the devices indoors.

<sup>26</sup> SBE Comments at 3.

<sup>27</sup> *Id.*

Contrary to Intel's claim, it is simply not true that all information on the over 3200 full service analog and digital television channels and the nearly 8,000 Class A, low power and translators channels presently in operation in the U.S. are "precisely documented" in the FCC's database.<sup>28</sup> Thus, static databases are inherently not reliable for determining interference protection.

Likewise, the "control signal" approach would not be sufficiently reliable to justify moving forward with the unlicensed devices proposal. First, because of the "always on" nature of many Wi-Fi-like devices, it must be shown that the unlicensed devices would "continue to do background scans on the TV channel it currently is cleared to be on."<sup>29</sup> Otherwise, the typical Wi-Fi device will "preclud[e] or interfer[e] with the reception of signals from licensed stations."<sup>30</sup> Pappas offers a helpful illustration of the unresolved "hidden node" problem, which presents another call for further study and caution regarding the unlicensed devices proposal:

"[I]magine someone taking a commuter bus from Fredericksburg, Virginia, to the FCC headquarters in downtown Washington, D.C. In Fredericksburg, it is likely that the unlicensed device will receive a control signal permitting operation on Channel 45, since Fredericksburg is outside the service contour for Channel 45 in Baltimore, Maryland. That commuter intends, however, for the device to be operational until it reaches the FCC in Washington, D.C., which is well-within the Grade B signal of Channel 45 . . . [However,] it is not clear that unlicensed devices will be immune from control signals that are unintentionally received outside of the intended unused service area for a particular channel, due to unusually terrain or signal propagation characteristics, e.g., extremely flat land or over bodies of water."<sup>31</sup>

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<sup>28</sup> Intel Comments at 7.

<sup>29</sup> Comments of ATK Audiotek, ET Docket No. 04-186 (filed Nov. 30, 2004) (ATK Comments) at 7.

<sup>30</sup> SBE Comments at 4.

<sup>31</sup> Pappas Comments at 11-12.

The Commission should not authorize unlicensed devices to occupy the television broadcast spectrum until reliable interference-prevention techniques are developed, tested, and proven. The record before the Commission simply would not support such authorizations.

**B. Even If The Proposed Interference Mitigation Techniques Worked As Promised, The Viewing Public Would Still Experience Harmful Interference.**

Even if spectrum sensing or similar technologies were sufficiently developed and implemented, the public's television service – both when delivered over the air and by cable – would still suffer under the unlicensed devices proposal. Unlicensed devices would exceed adjacent channel D/U ratios, desensitize television receivers – preventing viewers from watching television *on any channel* – expose cable households to direct pickup of interference, and elevate the noise floor in the television bands to unacceptable and irreversible levels. The result would harm broadcasters, cable operators, public safety officials, and ultimately, the public at large.

When operated indoors, most personal/portable unlicensed devices would render television sets unusable. Communications Research Centre Canada (CRC Canada) has extensively documented the desensitizing effect of portable unlicensed devices on both analog and digital television sets.<sup>32</sup> It is noteworthy that IEEE, which would presumably set industry standards applicable to the unlicensed devices operating in the broadcast spectrum, was silent on the Commission's portable device proposal. After nine months of intense analysis and deliberations, the IEEE group responsible for reviewing and commenting on the instant proceeding could not reach consensus on whether *any* rules for portable operations would insure adequate protection to the public's television reception. Because the Commission's Part 15 rules allow portable devices to emit radiofrequency energy at levels *higher* than the receiver

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<sup>32</sup> MSTV and NAB at 8-12 and App. A.

equivalent noise floor for digital and analog television receivers, portable devices will desensitize a receiver as far away as 24 meters, preventing reception *on any channel*. As MSTV and NAB explained in their initial comments, these disruptions could have a disastrous effect on consumers' adoption of DTV technology.

While in theory a consumer could eliminate this problem by turning off an unlicensed device, the Commission should not presume that viewers with the desensitizing portable devices in their households will understand the connection between the unlicensed device and problems with their television set(s). As the Consumer Electronics Association (CEA) explains, "It is very unlikely that consumers will understand that they are being interfered with by an unlicensed device."<sup>33</sup> Unlike traditional unlicensed devices, such as cordless phones or garage door openers, unlicensed devices using broadband technology will likely be on throughout the day and thus there will be few opportunities for affected consumers to discover the relationship between the unlicensed device and television interference.

In hotels, offices, apartment buildings, and other multi-dwelling units, the interfering unlicensed device will often not be under the control of the person whose television has inexplicably ceased to operate. The Notice, however, would mistakenly presume that devices as far away as *10 meters* (approx. 33 feet) are within the unlicensed device operator's control and would therefore allow devices within that range to violate undesired signal limits.<sup>34</sup> In urban as well as suburban areas, that 10 meter range would extend outside the dwelling in

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<sup>33</sup> CEA Comments at 10.

<sup>34</sup> *Unlicensed Operation in the TV Broadcast Bands*, Notice of Proposed Rulemaking, ET Docket No. 04-186, FCC 04-113 (rel. May 24, 2004) ("Unlicensed Devices NPRM") at ¶31, n. 50.

which the unlicensed device is operated. As Cohen, Dippell and Everist, P.C. explain, “a 1 meter, or no more than 3 meter, zone is more appropriate.”<sup>35</sup>

Moreover, both fixed and portable unlicensed devices would operate at exceedingly high power levels. Motorola’s technical analysis shows that out-of-band emissions (OOBE) from unlicensed devices operating inside a grade B television contour could “exceed the FCC specified D/U required field strengths by over 35 dB.”<sup>36</sup> Even under the more conservative Monte Carlo analysis, the unlicensed devices would exceed the FCC’s D/U requirements “by over 16 dB.”<sup>37</sup> IEEE also acknowledges that the D/U protection ratios required of the unlicensed devices “may need to vary depending on the modulation used by the desired and undesired signals.”<sup>38</sup> As SBE concludes, the high emission levels proposed by the Notice would “wipe out reception of a licensed TV station to a whole apartment complex if the high power Part 15 transmitter is close to a master antenna receiving system.”<sup>39</sup> MSTV and NAB accordingly agree with Motorola that “Part 15.209(a) emission levels do not provide adequate protection to TV receivers within the protected contour and further analysis is warranted.”<sup>40</sup>

The OOBE concerns documented by Motorola demonstrate the folly of Microsoft’s request that the Commission *exempt* unlicensed devices from Part 15 out-of-band emission limits to television services, because those emissions would be in the same “band” (*i.e.*,

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<sup>35</sup> Cohen Dippell and Everist Comments at 6.

<sup>36</sup> Motorola Comments at 12.

<sup>37</sup> *Id.*

<sup>38</sup> IEEE Comments at 15-16.

<sup>39</sup> SBE Comments at 4.

<sup>40</sup> Motorola Comments at 12. *See also* Comments of Cox Broadcasting Inc., ET Docket No. 04-186 (filed Nov. 30, 2004) at 9.

the television broadcast spectrum) as the unlicensed device.<sup>41</sup> While the Notice's proposed power limits for unlicensed devices won't protect television viewers, the situation would be even worse if the devices could exceed OOB limits throughout the television spectrum. If granted, Microsoft's request would degrade the public's free and universal over-the-air television service to the regulatory status of a garage door opener.

The Notice also would allow portable devices to exceed adjacent channel D/U requirements, which will unquestionably generate harmful interference. A portable device operating on an adjacent television channel can generate harmful interference as far away as 1550 meters from a digital television set or 439 meters from an analog television set.<sup>42</sup> In its comments, CEA explains how exempting portable devices from adjacent channel D/U limits "overlooks the physical realities of receiver design."<sup>43</sup> Specifically, "[f]ilters [in television receivers] can never completely reject the energy in adjacent channels and generally reject more energy from channels that are farther away frequency-wise from the tuned channel."<sup>44</sup> Motorola also suggests that "the maximum transmit power be reduced to comply with the adjacent channel D/U requirement."<sup>45</sup> At the very least, the Commission should restrict unlicensed devices from exceeding adjacent channel D/U limits.<sup>46</sup>

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<sup>41</sup> Microsoft Comments at 26 (objecting to the proposed requirement that outside of its occupied channel, the unlicensed device must attenuate its highest 100 kHz bandwidth power level by 20 dB).

<sup>42</sup> MSTV/NAB Comments at 9, n. 22.

<sup>43</sup> CEA Comments at 9.

<sup>44</sup> *Id.*

<sup>45</sup> Motorola Comments at 14.

<sup>46</sup> The Commission should also investigate the interference potential of unlicensed devices operating in taboo channels.

Unlicensed devices operating in the television broadcast spectrum would harm cable viewers as well. One problem is “direct pickup,” whereby an unlicensed device operates in a channel “vacant” of a broadcast signal but occupied by a consumer’s cable-ready device for receipt of MVPD services.<sup>47</sup> Both CEA and the National Cable & Telecommunications Association (NCTA) urge that the Commission address this concern.<sup>48</sup> NCTA explains that “[f]or the millions of television receivers and VCRs connected to cable,” the unlicensed device operation “will result in uncorrelated direct pickup noise, and an impediment to reliable reception of products and service that cable customers enjoy today.”<sup>49</sup> SBE explains how the Notice’s recognition that unlicensed devices should be excluded from TV channels 2-4 to avoid interference to consumer electronics outputting on those channels “must logically” extend to all other in-core channels, “because these frequencies can be (and are) used by cable-ready TV receivers.”<sup>50</sup> Second, many of the RG-6 or RG-59 cables which connect millions of televisions to MVPD services would experience debilitating ingress interference from portable unlicensed devices.<sup>51</sup> Moreover, rural cable companies may be unable to deliver distant broadcast signals to their customers if the headend receives that signal outside the television station’s Grade B contour.

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<sup>47</sup> Comments of the National Cable & Telecommunications Association, ET Docket No. 04-186 (filed Nov. 30, 2004) (NCTA Comments) at 6.

<sup>48</sup> *Id.*; CEA Comments at 10-11. To mitigate the direct pickup problem, CEA advises the Commission to set a 20 mW EIRP limit for portable unlicensed devices. *Id.*

<sup>49</sup> *Id.*

<sup>50</sup> SBE Comments at 9-10.

<sup>51</sup> The CRC Study documents the potential for ingress interference to RG-6 and RG-59 cables. *See* MSTV/NAB Comments at App. A.

Compounding these immediate interference problems is a more long-term threat: in CEA's words, "these devices will necessarily raise the noise floor in the TV bands."<sup>52</sup> With an unlimited number of devices allowed to crowd the broadcast spectrum, the quality of broadcast, public safety, and other licensed communications over that spectrum will necessarily decline. This trend would be irreversible and continually escalating. A low noise floor is critical if the Commission is to uphold its longstanding commitment to a robust, universal, and free over-the-air television service.

**C. Neither The Commission Nor Commenters Have Identified A Practical Mechanism For Enforcing The Interference Protection Rules Against Unlicensed Devices.**

Once unlicensed devices are sold, neither broadcasters nor the Commission will be able to protect the viewing public from interference conflicts, despite the broadcast service's primary status and however well-meaning the Commission's intentions at this time. The absence of a practical means to enforce the Part 15 interference protection rules is a major failing of the unlicensed devices proposal.<sup>53</sup>

Affected viewers will not necessarily contact their local broadcasters or the Commission when experiencing harmful interference. Cohen, Dippell and Everist, P.C., an engineering firm with over 60 years experience, comments on the many "instances where the public is not aware of the reason that their reception is being suddenly impaired by a new device

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<sup>52</sup> CEA Comments at 10.

<sup>53</sup> See, e.g., Comments of the Community Broadcasters Association, ET Docket No. 04-186 (Nov. 30, 2004) at 6 ("There is a significant potential for abuse where spectrum is being shared between services that are very different in their nature, and where equipment is distributed in large quantities for use by unsophisticated private individuals. The Commission's enforcement resources are limited.").

operating in the area.”<sup>54</sup> Many consumers will simply assume that they have a defective television set or that for inexplicable reasons they may no longer rely on free, over-the-air television and instead must pay a cable or satellite provider for that service. (And as explained above, they may still experience problems from unlicensed device interference to those services.) The Commission may not even have the opportunity to *attempt* to correct unlicensed device interference.

When a viewer does raise concerns which lead the Commission or local broadcasters to believe an unlicensed device is generating harmful interference, little could be done to help that viewer. SBE comments on “the difficulty of *finding* an offending high power Part 15 device, to say nothing of persuading the operator of that device to shut it down.”<sup>55</sup> There will be no record of where unlicensed devices operating on the broadcast spectrum end up. Especially in populated areas, an offending unlicensed device will be the proverbial needle in the haystack. As NCTA explains, “the presence of hundreds or thousands of the devices could create an electromagnetic cloud making it nearly impossible to identify a single source of interference in the presence of many such sources.”<sup>56</sup> Qualcomm agrees that it could be “impossible” to “pinpoint and cure harmful interference” from unlicensed devices.<sup>57</sup>

Those commenters supporting the Notice’s proposal gloss over the enforcement problem. New America asserts that the Commission can make clear it will “cancel its certification of devices and may order recalls of devices if necessary,” without addressing *how*

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<sup>54</sup> Comments of Cohen, Dippell and Everist at 3-4.

<sup>55</sup> SBE Comments at 7 (emphasis in original).

<sup>56</sup> NCTA Comments at 3.

<sup>57</sup> Qualcomm Comments at 12.

the problem could be identified and *how* such a recall could be accomplished.<sup>58</sup> Common sense suggests, however, that the Commission cannot rely on cavalier assertions of enforceability. Just as the Commission could not order recall of every 2.4 GHz Wi-Fi device (many of which are embedded in laptop and desktop computers), it could not order a recall of unlicensed devices interfering with the public's television service. Past enforcement experience also demonstrates the need for caution now. For example, despite the Commission's earnest efforts, it could not prevent the distribution and use of illegal high-power amplifiers in the citizens band (CB) that effectively stifled that service.<sup>59</sup> As the Commission noted in 1997, "[e]ach year, the FCC receives tens of thousands of complaints from the public involving interference" from illegal CB radios and power amplifiers.<sup>60</sup> The Commission should not introduce unlicensed devices into the broadcast spectrum without a practical and effective means for upholding the licensed service's primary status.

**D. The Commission Should Not Breach Its Longstanding Commitment To The Technical Integrity Of The Public's Television Service By Awarding Unprecedented And Prohibited Entitlements To Unlicensed Devices.**

Unless reliable means to prevent unlicensed devices from interfering with the public's television service are developed, tested, and implemented, adoption of the unlicensed devices proposal would grant – for the first time in its history – a *de facto* interference right to unlicensed devices. The Commission's existing policies on unlicensed devices serves the

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<sup>58</sup> New America Comments at 34.

<sup>59</sup> See *Radio Frequency (RF) Interference to Electronic Equipment*, 70 FCC 2d. 1685 (1978) (describing concerns that amplifiers of CB radios degrade CB service and create a “domino effect,” *i.e.*, many licensees in attempting to outperform their CB neighbors, compete with one another via impermissible equipment to ensure that their transmissions are not drowned out by others with more powerful operations.”

<sup>60</sup> News Release, *Federal Communications Commission Unveils Joint Criminal Investigation*, Report No. CI 97-11 (Oct. 2, 1997).

American public's interest in reliable and high-quality communications. The Commission should not so depart from its longstanding and legally-required commitment to protect viewers of over-the-air television and other licensed services.

Without any legal basis, proponents of the unlicensed devices proposal seek to use this proceeding to fundamentally alter the *ex ante* interference protection long provided to the viewing public. New America, for example, argues that "to prohibit deployment of Part 15 devices in the broadcast bands because such devices might create harmful interference and cannot easily be recalled is unreasonable and irrational."<sup>61</sup> Similarly, Microsoft asks the Commission to do away with even the few interference mitigation techniques proposed by the Notice because they would "overload licensed-exempt designers by requiring them to integrate an array of interference avoidance techniques into what are supposed to be low cost devices."<sup>62</sup> These commenters essentially ask the Commission to weigh the public interest harms caused by a significant degradation in the public's access to free, over-the-air and even cable television against the speculative benefits of additional spectrum for unlicensed devices. A decision based on such a calculation would be both unprecedented and unlawful.<sup>63</sup>

Since their introduction in the 1930s, lawful unlicensed devices have operated under a strict "do no harm" principle. This has been true of devices ranging from the most primitive remote control to today's state-of-the-art Wi-Fi chips.<sup>64</sup> Every unlicensed device

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<sup>61</sup> New America Comments at 34.

<sup>62</sup> Microsoft Comments at 16.

<sup>63</sup> See, e.g., 18 FCC Rcd. 1279, 1294 (2003) (discussing Congress's requirement that the Commission establish rules to "protect analog and digital television service" in the 700 MHz bands from potentially interfering uses by new licensed wireless operators in that band).

<sup>64</sup> See, e.g., Tom Krazit, *Intel Unveils Tri-Mode Wi-Fi Chip*, PCWorld.com (Aug. 26, 2004), available at <http://www.pcworld.com/news/article/0,aid,117584,00.asp> (last visited Jan. 27, 2005) (describing a chip which (continued...))

lawfully sold in the U.S. over the past seven decades has been expected and required to not interfere with any licensed service.<sup>65</sup> Similarly, these devices have had no right of protection from interference generated by other services, whether licensed or unlicensed. When an unlicensed device does create harmful interference to a licensed user, the unlicensed device has always been legally bound to cease operation until and unless it corrects the problem.<sup>66</sup>

These well-established principles of unlicensed device operation serve the public interest in interference-free communications. As Commissioner Abernathy has stated, when too many devices attempt to “speak” at the same time, communal use results in “reckless abuse by individual users.”<sup>67</sup> This is when the “tragedy of the commons results” – whereby no user, licensed or unlicensed, is able to enjoy the benefits of radiocommunication. Advocates of a hasty decision on the unlicensed devices proposal overlook these concerns. Indeed, New America has analogized the alleged ability of licensed services to “co-exist” with high-power unlicensed devices to individual conversations which take place within “a crowd of people at a football stadium.”<sup>68</sup> New America writes, “Though thousands of [people] are talking at the same time . . . there is no need for regulation to ensure effective communication.”<sup>69</sup> Of course, most people would not want their everyday conversational abilities to be subjected to the noise level

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“allows laptops based on Intel's Centrino platform to connect to the three most commonly used wireless networks found in enterprises and homes.”).

<sup>65</sup> See 47 C.F.R. § 15.5. The Commission’s rules define “harmful interference” as “[i]nterference which endangers the functioning of a radionavigation service ... or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service.” *Id.* at § 2.1.

<sup>66</sup> *Id.* at § 15.5.

<sup>67</sup> Remarks of Commissioner Kathleen Abernathy before the San Diego Telecom Council, July 18, 2002.

<sup>68</sup> Werbach/New America White Paper at 6.

<sup>69</sup> *Id.*

present at the average football stadium. Just as a massive crowd raises the conversational “noise floor,” the proliferation of unlicensed devices in licensed spectrum bands would significantly degrade the quality of radiocommunications over licensed (as well as unlicensed) spectrum.

In addition to creating a seismic policy shift, the Commission would violate the Communications Act if it were to allow an unlicensed device to interfere with a licensed service. Section 301 of the Act provides, “No person shall use or operate any apparatus for the transmission of energy or communications or signals by radio . . . except . . . with a license.”<sup>70</sup> As the Commission recently reaffirmed in its Order concerning unlicensed ultra-wideband (UWB) devices, the Communications Act requires it to license “any apparatus that transmits enough energy to have a significant potential for causing harmful interference.”<sup>71</sup> As evidenced by analyses submitted by Motorola, MSTV, CEA, Shure, and SBE (to name a few) in their initial comments, unlicensed devices operating in the television bands not only possess the *potential* for such interference, field tests clearly demonstrate they *will cause harmful* interference.

Section 302(a) of the Act similarly restricts use of harmful unlicensed devices.<sup>72</sup> Section 302(a) allows the Commission, “consistent with the public interest, convenience, and necessity” to make “reasonable regulations . . . governing the interference potential of devices which in their operation are capable of emitting radio frequency energy . . . in sufficient degree

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<sup>70</sup> 47 U.S.C. § 301.

<sup>71</sup> Second Memorandum Opinion and Order, *Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems*, FCC 04-285, ET Docket No. 98-153 (rel. Dec. 16, 2004) at ¶ 68.

<sup>72</sup> See *Ex Parte* Presentation of the Media Access Project relevant to ET Docket Nos. 03-108, 03-237, 04-151, and 04-186 (Dec. 14, 2004) (Media Access/New America ex parte) at 6 (“Recently, the Commission has intimated that its authority for Part 15 flows from Section 302, rather than directly from Section 301 . . . This interpretation has little support in the legislative history of Section 302.”).

to cause harmful interference to radio communications.”<sup>73</sup> When the Commission has relied on section 302(a) as authority for its Part 15 rules, it has stated clearly that only devices with “little risk of interference to licensed services” may operate without a license.<sup>74</sup> Indeed, as New America tacitly acknowledges, the legislative history of section 302(a) suggests that Congress added the provision to *restrict*, not enable, harmful emissions from unlicensed devices.<sup>75</sup> If sections 301 and 302 of the Communications Act are to have any meaning, the Commission should reject any proposal, including that described in the Notice, which would allow unlicensed devices to interfere with, or demand protection from, lawfully-operating licensed services.

## **II. THE DIGITAL TRANSITION IS THE LEAST APPROPRIATE TIME FOR ADOPTION OF NEW USES IN THE BROADCAST SPECTRUM.**

Commenters who would have unlicensed devices put into the public’s broadcast spectrum fail to address a critical reality: the ongoing transition to digital television. Because virtually all stations are transmitting both an analog and digital signal during the transition, the broadcast spectrum is too crowded to support new uses. If the Commission adopts the proposed service, the DTV transition as well as the planned digital conversion of low power television services will be significantly hampered.<sup>76</sup> In light of this risk, there is no basis for authorizing unlicensed devices to operate in the crowded broadcast spectrum at this time.

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<sup>73</sup> 47 U.S.C. § 302(a).

<sup>74</sup> *Amendment of Part 15 of the Commission’s Rules to Allow Certification of Equipment in the 24.05 - 24.25 GHz Band*, 16 FCC Rcd. 22337, 22342 (2001).

<sup>75</sup> Media Access/New America ex parte at 6-7.

<sup>76</sup> See, e.g., APTS Comments at 3 (“[S]hould the Commission introduce unlicensed devices into the TV band, APTS urges it [to] consider doing so only after the transition to digital [television] has been completed in relevant markets. This would ensure that as the DTV channel repacking process that the Commission has approved goes forward it will not become unnecessarily complicated by the presence of unlicensed devices in the TV band.”).

**A. Unlicensed Devices Would Be Particularly Disruptive During The Digital Transition.**

The interference potential of unlicensed devices will be at its highest during the digital transition. Thus, adoption of the unlicensed devices proposal could indefinitely delay the digital transition. Unlicensed devices would be squeezed in between more than 3200 analog and digital signals. The Commission should accordingly postpone consideration of the unlicensed devices proposal until analog broadcast spectrum has been surrendered pursuant to a successful digital transition.

By interfering with consumers' ability to receive DTV signals, unlicensed devices would stunt consumer adoption of digital technology, slowing the pace of the digital transition. In many communities, the over-the-air signal is the *only* means of receiving a broadcast station's HDTV programming.<sup>77</sup> Thus, "early adopters" of digital technology will have little positive to say about digital television if unlicensed devices disrupt over-the-air television service. SBE advises that "[i]f the Commission wants to encourage the early purchase of DTV receivers and set-top boxes by America's viewing public, the last thing it should be doing is planting high power Part 15 'land mines' into the DTV landscape."<sup>78</sup> As Qualcomm warns, "There is a genuine risk that ... consumers who spend substantial sums of money for a DTV-capable set and then experience interference ... may well return the DTV-capable set, thereby making it more difficult to reach the 85% mark" for concluding the transition in a given market."<sup>79</sup>

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<sup>77</sup> See, e.g., *Three Ways to Get HDTV Programming*, CNET.com, available at [http://www.cnet.com/4520-7874\\_1-5108854-3.html](http://www.cnet.com/4520-7874_1-5108854-3.html) (last visited Jan. 25, 2005) ("While a good number of cable networks are broadcasting in HDTV, they've been slow in rolling out the service to their customers, and there's no sign of that changing soon.").

<sup>78</sup> SBE Comments at 6.

<sup>79</sup> Qualcomm Comments at 9. Qualcomm addresses the unlicensed devices proposal as a 700 MHz licensee that is "anxious for an end to the DTV transition to come as rapidly as possible." *Id.* at 7.

Although Congress has paid relatively little attention to unlicensed devices, it has expressed considerable interest in seeing the digital transition brought to a successful conclusion. Even in the short time since initial comments were filed in this proceeding, Congress has explored ways to complete the transition.<sup>80</sup> Adoption of the unlicensed devices proposal would disappoint Congressional expectations that the Commission will foster a successful and consumer-friendly conclusion to the digital transition.

The Commission's ongoing and carefully-developed channel election process calls for further caution. This process, by which broadcasters will select a channel for DTV operation after the transition, will not conclude until 2006 at the earliest. Even without the impediment of unlicensed devices, the channel election process is already a challenge for broadcasters and the Commission alike. As the Association of Federal Communications Consulting Engineers (AFCCE) recently explained in requesting additional time for filing first round elections, "[b]ecause a station will remain on the channel selected for the foreseeable future, careful study needs to be exercised in making this selection so that an optimization of the coverage can be done prudently and wisely."<sup>81</sup> SBE explains that "[t]his is not the time to be hindering or sabotaging the [channel election] process by allowing an impossible-to-take back contamination of in-core TV channels by high power Part 15 devices that may or may not respect their Part 15 status."<sup>82</sup> Qualcomm also raises many important questions about the effect of

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<sup>80</sup> See e.g., S. 2845 § 7501, 108th Cong. (2004) (enacted).

<sup>81</sup> Letter from Thomas B. Sullivan, President, AFCCE, to Marlene H. Dortch, Secretary, FCC, Jan. 14, 2005, at 2. The Commission extended the filing date for indicating First Round Elections from Jan. 27, 2005 to Feb. 10, 2005 "[i]n view of our interest in a smooth and accurate channel election process." See Order Granting Further Extension of Time to File First Round DTV Channel Election Forms, *Second Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MB Docket No. 03-15, DA 05-164, ¶ 3 (rel. Jan. 24, 2005).

<sup>82</sup> SBE Comments at 6.

unlicensed devices on this complex process, such as “[w]hat would happen if a TV station elected a channel, only to find out that unlicensed devices were already operating on that channel?”<sup>83</sup> Such questions call attention to the likely disruptive effect of unlicensed devices on the channel election process.

**B. There Is Little “White Space” Spectrum Available In Populated Areas During The Digital Transition, And Digital Low Power Television Stations Will Need The A Majority Of The “White Space” Spectrum After The Full Power Transition Is Complete.**

Using the Commission’s proposed television protection criteria, both MSTV and Motorola have determined that “there is little available spectrum in major metropolitan areas due to the higher concentration of broadcast stations.”<sup>84</sup> Tests conducted by TechWare, Inc., show that few or no “white space” channels are available for unlicensed operation during the transition.<sup>85</sup> Even where there are “white spaces,” the availability of spectrum varies significantly from one small geographic cell to the next. The benefits cited by promoters of the Notice’s proposal – “free[ing] up un-used capacity for innovative new wireless applications” – would thus fail to materialize.<sup>86</sup> With few benefits but many harms from proceeding with the unlicensed devices proposal during the digital transition, the Commission should defer consideration of that proposal until the transition is complete.

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<sup>83</sup> Qualcomm Comments at 7-8.

<sup>84</sup> Motorola Comments at 5.

<sup>85</sup> MSTV/NAB Comments at 17-22.

<sup>86</sup> Comments of Wireless Unleashed at 1.

Unlicensed devices would also conflict with the Commission's decision to "hasten the transition of LPTV and TV translator stations to digital operations."<sup>87</sup> In September 2004, the Commission authorized the licensing of digital LPTV and television translator stations (collectively, "digital low power television services") to operate on a secondary basis to full-service television stations, public safety, commercial wireless, and other primary services.<sup>88</sup> As a result, 2,100 licensed LPTV and 4,700 licensed television translator stations are eligible to "flash cut" to digital operations.<sup>89</sup> At a later date, the Commission will *require* these stations to make that conversion.<sup>90</sup>

The Commission should take notice that the rural areas into which Intel, New America, Wireless Unleashed, and other parties suggest unlicensed devices would be deployed depend heavily upon low power television services.<sup>91</sup> In his separate statement to the recent digital low power television Order, Commissioner Adelstein stated: "[t]housands of translators and low power stations across our country fill a vital need as the primary source of over-the-air television for people in Rural America. As I've seen firsthand, often these stations are the only

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<sup>87</sup> Report and Order, *Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend the Rules for Digital Class A Television Stations*, MB Docket 03-185, FCC 04-220 (rel. Sept. 30, 2004), ¶1 (Digital LPTV Order).

<sup>88</sup> *Id.* at ¶2.

<sup>89</sup> *Id.* at ¶19. Reflecting the lack of available "white space" during the transition, the Commission also wrote, "we do not expect spectrum for new low power digital operations, as 'companion' channels for existing analog programming services, to become available until TV channels are surrendered by full-service stations at the end of the full-service DTV transition period." *Id.* at 15.

<sup>90</sup> *Id.* In a Petition for Reconsideration to the Commission's digital low power television rules, New America even seeks to relegate digital low power television to the status of a Part 15 device, operating "subject to interference by ... Part 15 devices proposed to be authorized in ET Docket No. 04-186." See Petition for Clarification of New America Foundation and The Champaign Urbana Wireless Internet Network, MB Docket No. 03-185 (filed Dec. 29, 2004) at ii. The Commission should reject this request which, as described above, would violate the Communications Act.

<sup>91</sup> Intel Comments at 9-10; Wireless Unleashed Comments at 18-19; New America Comments at vii.

station in an area providing local news, weather, public affairs and emergency programming.”<sup>92</sup>

Those same viewers would be deprived of digital low power television services if the Commission adopts the unlicensed devices proposal.

**III. THE COMMISSION SHOULD REDRAW AND TEST ITS PROPOSAL IN LIGHT OF THE COMPLEX AND IMPORTANT QUESTIONS RAISED BY COMMENTERS, ESPECIALLY THOSE CONCERNING THE TRANSITION TO DIGITAL TELEVISION.**

Commenters have raised significant concerns regarding the feasibility of the Notice’s unlicensed devices proposal. Although there is unanimous praise for the Commission’s desire to efficiently utilize spectrum, all but the most strident parties in this proceeding have urged caution. As the Spectrum Policy Task Force recognized in its seminal report in 2002, the television broadcast spectrum is not well suited to new shared uses.<sup>93</sup> Any decision to the contrary requires careful planning if it is to yield long term net benefits. The public’s television service should not become a testing ground for unproven technologies, especially during the digital transition. The Commission should therefore heed Qualcomm’s advice that the interference issues be definitively resolved, “not just on paper, but in the real world.”<sup>94</sup> MSTV and NAB agree with Motorola, which documents the need for “detailed system simulation

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<sup>92</sup> Digital LPTV Order, Separate Statement of Commissioner Jonathan S. Adelstein, Approving in Part and Concurring in Part.

<sup>93</sup> See Report of the Spectrum Policy Task Force, ET Docket No. 02-135 (Nov. 2002) “In the case of broadcasting, evolution towards greater flexibility is governed for the time being by the statutorily-mandated DTV transition process, making additional regulatory changes impractical at least until that process is complete.”

<sup>94</sup> Qualcomm Comments at 11.

studies and experimental verification . . . to demonstrate that personal/portable control signals can be constrained by application of worst-case path loss modeling.”<sup>95</sup>

At a minimum, the Commission should not allow unlicensed devices into the public’s television broadcast spectrum until the conclusion of the digital transition. In addition, MSTV and NAB urge the Commission to conduct verifiable field tests and other appropriate investigations of the following topics:

- The appropriate power levels for fixed and, if feasible, portable unlicensed devices that would operate in the television broadcast spectrum, including:
  - The desensitization effects of portable devices on analog and digital television receivers and whether those effects could be mitigated through a reduction in the unlicensed devices’ power;
  - The emission levels necessary to preserve 1) viewers’ access to a free, over-the-air television signal within the protected contour, including operation on adjacent or taboo channels and 2) cable device immunity to direct pickup and ingress interference; and
  - The cumulative effect of unlicensed devices on the “noise floor.”
- The availability of inexpensive “cognitive” technologies that could reliably prevent unlicensed devices from transmitting over a particular frequency if that operation would interfere with a broadcast service.
- Enforcement mechanisms to terminate the interfering operation of an unlicensed device.
- The availability of spectrum “white spaces” for unlicensed device operations, taking into account the digital conversion of LPTV station and television translator stations.
- The relative benefits of *licensed* “white space” spectrum.<sup>96</sup>

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<sup>95</sup> Motorola Comments at 8.

<sup>96</sup> In its comments, Qualcomm discusses the possibility of *licensed* white spaces. See Qualcomm Comments at 11-13.

**CONCLUSION**

In light of the substantial concerns raised about the harmful effects unlicensed devices would have on the public's access to free, over-the-air and even cable television, the Commission should postpone consideration of any new uses for the television broadcast spectrum until the public has transitioned to digital television. It should then carefully investigate, through detailed real-world testing, the proper operating parameters of such new uses.

Respectfully submitted,

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